SUPPLEMENT TO THE ENVIRONMENTAL ASSESSMENT: WILDLIFE DAMAGE MANAGEMENT AT BALTIMORE/WASHINGTON INTERNATIONAL THURGOOD MARSHALL AIRPORT[1]

United States Department of Agriculture
Animal and Plant Health Inspection Service
Wildlife Services

In Cooperation with:

United States Department of Interior
Unites States Fish and Wildlife Service

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[1] The official name of the Baltimore/Washington International Airport has been changed to Baltimore/Washington International Thurgood Marshall Airport (BWI Marshall). For clarification, all reference to the airport will use the new official name of the airport and will be synonymous with any reference to the airport in the EA

1.0 INTRODUCTION

The U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services' (WS) program in 2003 prepared an environmental assessment (EA) titled *"Wildlife Damage Management at Baltimore/Washington International Airport"*. The EA evaluated potential impacts to the quality of the human environment from the implementation of a damage management program to address threats of property damage and threats to human safety associated with wildlife at the Baltimore/Washington International Thurgood Marshall Airport (BWI Marshall) and surrounding areas in Maryland (USDA 2003)[2]. The EA evaluated the need for damage management and the relative effectiveness of four alternatives to meet that proposed need, while accounting for the potential environmental effects of those activities. WS' proposed action in the EA implements an integrated damage management program on airport property and adjacent properties (within 2 miles of airport property) to fully address the need for reducing threats associated with wildlife while minimizing impacts to the human environment.

The EA analyzes the effects of WS' activities to reduce threats to property and human safety at BWI Marshall and surrounding areas associated with bird species and mammal species. Bird species addressed in the EA and this supplement include red-winged blackbirds (*Agelaius phoeniceus*), European starlings (*Sturnus vulgaris*), brown-headed cowbirds (*Molothrus ater*), eastern meadowlarks (*Sturnella magna*), horned larks (*Eremophila alpestris*), killdeer (*Charadrius vociferous*), Canada geese (*Branta canadensis*), mallards (*Anas platyrhynchos*), other ducks (family Anatidae), Bonaparte's gulls (*Larus philadelphia*), herring gulls (*Larus argentatus*), laughing gulls (*Larus atricilla*), ring-billed gulls (*Larus delawarensis*), terns (*Sterna* spp.), great blue herons (*Ardea herodias*), cattle egrets (*Bubulcus ibis*), great horned owls (*Bobo virginianus*), barred owls (*Strix varia*), red-tailed hawks (*Buteo jamaicensis*), red-shouldered hawks (*Buteo lineatus*), black vultures (*Coragyps atratus*), turkey vultures (*Cathartes aura*), American kestrels (*Falco sparverius*), wild turkeys (*Meleagris gallopavo*), mourning doves (*Zenaida macroura*), rock pigeons (*Columba livia*), barn swallows (*Hirundo rustica*), tree swallows (*Tachycineta bicolor*), American crows (*Corvus brachyrhynchos*), common grackles (*Quiscalus quiscula*), blue jays (*Cyanocitta cristata*), northern cardinals (*Cardinalis cardinalis*), house sparrows (*Passer domesticus*), grasshopper sparrows (*Ammodramus savannarum*), and northern mockingbirds (*Mimus polyglottos*).

Mammal species addressed in the EA and this supplement include white-tailed deer (*Odocoileus virginianus*), coyotes (*Canis latrans*), red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), raccoons (*Procyon lotor*), opossums (*Didelphis virginianus*), feral cats (*Felis* spp.), feral dogs *(Canis* spp.), striped skunks (*Mephitis mephitis*), cottontail rabbits (*Sylvilagus floridanus*), beaver (*Castor canadensis*), and woodchucks (*Marmota monax*).

Comments from the public involvement process during the development of the pre-decisional EA were reviewed for substantive issues and alternatives which were considered in developing the Decision for the EA. After consideration of the analysis contained in the pre-decisional EA and review of public comments, a Decision and Finding of No Significant Impact (FONSI) for the EA was signed on October 7, 2003. The Decision and FONSI selected the proposed action which implemented an integrated damage management program at BWI Marshall and adjacent properties using multiple methods to adequately address the need to reduce hazards associated with aircraft striking wildlife. The EA and this supplement are tiered to WS' programmatic Final Environmental Impact Statement (FEIS) (USDA 1997)[3].

[2]Copies of the EA and the associated Decision/Finding of No Significant Impact (FONSI) are available for review by sending a request to State Director, USDA-APHIS-WS, 1568 Whitehall Road, Annapolis, MD 21409 or by visiting the APHIS website at http://www.aphis.usda.gov/wildlife_damage/nepa.shtml.
[3]Copies of WS' FEIS are available from USDA/APHIS/WS, Operational Support Staff, 4700 River Road, Unit 87, Riverdale, MD 20737-1234.

All wildlife damage management activities, including disposal requirements, are conducted consistent with: 1) Endangered Species Act, 2) Migratory Bird Treaty Act, 3) Executive Order (EO) 12898[4], EO 13045[5], EO 13112[6], and EO 13186[7], 4) the Federal Insecticide, Fungicide, and Rodenticide Act, and 5) federal, state, and local laws, regulations, and policies.

2.0 PURPOSE

The purpose will remain as addressed in section 1.2 of the EA (USDA 2003). This monitoring report along with the proposed supplement to the aforementioned EA examines potential environmental impacts of WS' program as it relates to: 1) an increase in the need to reduce threats to property and human safety at BWI Marshall and surrounding areas, 2) new issues and data that have become available from public comments, research findings, and data gathering since the issuance of the Decision/FONSI in 2003 and the last monitoring report, and 3) analyzes WS' wildlife damage management activities at BWI Marshall since the Decision/FONSI was signed to ensure program activities are within the potential impact parameters analyzed in the EA.

The monitoring report and the proposed supplement to the EA are two separate analyses; however, to simplify WS' environmental processes and reduce the volume of paper those analyses are being combined into a single record. The monitoring report will pertain to the analyses of WS' wildlife damage management activities at BWI Marshall and adjacent properties since the 2003 Decision/FONSI was signed for the EA to ensure WS' activities remain within the scope of analyses contained in the EA. The supplement to the EA will analyze the need for increasing WS' wildlife damage management activities along with the potential impacts to the human environment to meet those increasing needs at BWI Marshall and surrounding areas.

3.0 NEED FOR ACTION

A description of the need for action to address threats to property and threats to human safety associated with birds and mammals at BWI Marshall and surrounding areas is provided in section 1.3 of the EA (USDA 2003). The need for action addressed in the EA remains applicable to this proposed supplement to the EA and the monitoring report. The need for action at BWI Marshall and adjacent properties is based on a need to manage wildlife to reduce threats associated with aircraft striking wildlife which can cause extensive damage to aircraft. Damage to aircraft caused by a wildlife strike could potentially threaten air passenger safety if damage caused by the strike causes catastrophic failure of the aircraft resulting in the loss of control of the aircraft that leads to a crash. WS continues to receive requests for assistance to manage damage and threats to human safety caused by wildlife at BWI Marshall.

Since the completion of the EA, the U.S. Fish and Wildlife Service has prepared an Environmental Impact Statement (EIS) to address damage associated with an increasing resident goose population in the U.S., including threats to property and human safety (USFWS 2005). Additional information on Canada

[4] Executive Order 12898 promotes the fair treatment of people of all races, income levels and cultures with respect to the development, implementation and enforcement of environmental laws, regulations and policies.

[5] Executive Order 13045 ensures the protection of children from environmental health and safety risks since children may suffer disproportionately from those risks.

[6] Executive Order 13112 states that each Federal agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law; 1) reduce invasion of exotic species and the associated damages, 2) monitor invasive species populations, provide for restoration of native species and habitats, 3) conduct research on invasive species and develop technologies to prevent introduction, and 4) provide for environmentally sound control, promote public education on invasive species.

[7] Executive Order 13186 directs federal agencies to protect migratory birds and strengthen migratory bird conservation by identifying and implementing strategies that promote conservation and minimize the take of migratory birds through enhanced collaboration. A National-level MOU between the USFWS and WS is being developed to facilitate the implementation of Executive Order 13186.

goose populations and damage threats can be found in the resident Canada goose management FEIS prepared by the USFWS.

3.1 Proposed Supplement to the EA

Since the completion of the EA, the number of requests WS' has received for assistance to manage threats associated with aircraft striking wildlife have increased at the airport and adjacent properties for several bird and mammal species. The need for an increase in damage management activities at the airport and surrounding areas is based on an increase in the requests received to manage wildlife threats at the airport or based on a reasonably anticipation of an increase in requests for damage management activities for several species of wildlife that threaten property and human safety from possible strikes at the airport. As part of the increase in requests for assistance, WS reasonably anticipates an increase in the number of wildlife requested to be lethally removed as part of an integrated damage management strategy to reducing threats to aircraft and human safety. WS also anticipates an increase in non-lethal harassment and dispersal of those species addressed in the proposed supplement as part of the increasing requests for assistance.

Based on wildlife hazard assessments conducted since the completion of the EA at the airport and adjacent properties, three species of birds and two species of mammals are increasingly present on or near the airport and pose an increasing risk to aircraft and passenger safety. Since the completion of the EA, WS has been requested to reduce an increasing threat to aircraft and human safety from the airport authority caused by American kestrels, killdeer, mourning doves, red fox, and woodchucks.

The American kestrel is the smallest and most numerous of the North American falcons found widely distributed across the continent (Smallwood and Bird 2002). Kestrels can be found foraging on terrestrial arthropods and small vertebrates in a variety of open to semi-open habitats with sufficient perches. This preference for open habitats makes airports an attractive location for foraging, especially during migration. As shown in Table 1, the number of American kestrels addressed that posed a hazard to aircraft at BWI Marshall increased from no threats reported in federal Fiscal Year[8] (FY) 2003 and FY 2004 to 42 in FY 2005, 133 kestrels addressed in FY 2006, and 205 kestrels addressed in FY 2007. In Maryland, 33 aircraft strikes have been reported since 1990 where kestrels were identified as the bird struck with 76% of those strikes occurring since 2004 (Federal Aviation Administration 2007). WS' reasonably expects requests for assistance at the airport to manage threats posed by kestrels to increase based on the increasing presence of kestrels on the airport and the increase in the number of kestrels addressed to reduce threats since FY 2005. WS' will continue to employ an integrated management approach to reducing threats associated with kestrels at the airport, including the use of non-lethal and lethal techniques, as described in the EA. To address the increasing presence and associated hazards with kestrels at BWI Marshall and adjacent properties, the use of non-lethal dispersal and harassment techniques at the airport will increase with the lethal take of kestrels also likely to increase based on the requests for assistance received. This supplement will evaluate the potential impacts to the quality of the human environment from the increase in need to reduce threats associated with kestrels at the airport as part of an integrated management strategy.

Similar to the increased threat associated with kestrels, the number of killdeer addressed to reduce hazards to aircraft at the airport and surrounding areas has also increased recently. No threats associated with killdeer were reported from FY 2003 through FY 2005 at the airport (See Table 1). However, in FY 2006 and FY 2007, WS' employed an integrated damage management approach to reduce threats associated with an average of 250 killdeer in those two years at the airport. Killdeer are widespread and common across North America preferring open habitats common at airports

[8]The federal fiscal year begins on October 1 and ends on September 30 the following year.

(Jackson and Jackson 2000). There have been 18 reported aircraft strikes involving killdeer in Maryland with 95% of those reported strikes occurring since 2003. Since FY 2006, WS has received an increase in the number of requests to address hazards to aircraft and passenger safety at airports associated with potential strikes with killdeer. WS' will continue to use an integrated management approach to reduce threats associated with killdeer at BWI Marshall and surrounding areas. To meet the need for increased threat reduction at the airport associated with killdeer, WS' is proposing to increase the use of those methods described in the EA, in an integrated approach to effectively reduce threats. Based on the increasing threats associated with killdeer at the airport and surrounding areas, WS' reasonably anticipates that activities to reduce those threats will also likely increase. As part of an increase in threats, WS' reasonably anticipates the number of killdeer that will be lethally taken to increase to no more than 75 annually.

The gregarious flocking behavior of mourning doves during migration can pose threats to human safety and property at airports. Since 2003, strike records report aircraft struck mourning doves on 15 separate incidents in Maryland with 1,158 dove strikes reported in the United States (Federal Aviation Administration 2007). Since 1990, strikes involving mourning doves have been reported on 25 separate occasions at Maryland airports with 84% of those strikes being reported since 2002. This increase in the number of dove strikes since 2002 could be the result of an increased awareness of the hazards associated with wildlife strikes and/or could be linked to an increasing population of doves in the United States. As shown in Table 1, the number of doves addressed at BWI Marshall and surrounding areas has increased since FY 2003. In FY 2005 and FY 2006, WS' addressed a total of 3,490 doves compared to 394 from FY 2003 through FY 2005.

The presence of large concentrations of doves at the airport continues to be a concern for airport authorities at BWI Marshall. WS continues to work with airport personnel to manage habitat and conditions on airport property to decrease threats from doves. WS will also continue to employ non-lethal harassment and habitat modification techniques to reduce threats from large concentrations of mourning doves at the airport. To decrease the likelihood of habituation, WS will continue to enhance non-lethal harassment techniques through the use of lethal methods, primarily through the use of shooting. Due to the increasing presence of doves on the airfield and surrounding areas, WS reasonably anticipates an increase in program activities to manage threats posed by doves. Under the proposed supplement, WS' take could reach 500 doves annually. The increased take allows WS' to effectively manage threats associated with doves when requested by airport authorities.

Table 1 – The number of birds by species addressed at BWI Marshall and surrounding areas by WS from FY 2003 through FY 2007.

Species	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
American Kestrels	0	0	42	133	205
Killdeer	0	0	0	244	256
Mourning Doves	104	107	183	2,473	1,017

Red fox are considered a common resident throughout Maryland where suitable habitat exists. Fox pose a threat to aircraft during take-off and landing as fox move across runways and taxiways. Since 1991 in Maryland, 8 strikes involving aircraft and fox have been reported with nearly 88% occurring since 2003 (Federal Aviation Administration 2007). As shown in Table 2, WS' has continually addressed an increasing number of threats associated with red fox at BWI Marshall. Threats associated with red fox have increased annually since FY 2003 when no threats to aircraft were identified involving red fox at the airport to 42 red fox being addressed in FY 2007. WS continues to use an integrated approach to managing threats associated with red fox at the airport that includes the

use of non-lethal and lethal methods to effectively resolve threats to aircraft and passenger safety. WS reasonably anticipates the number of red fox addressed at the airport to continue to increase resulting in an increase in the number of fox harassed and taken by WS to address threats. Based on the number of red fox addressed in FY 2007, up to 50 red fox could be taken annually by WS as part of an integrated approach to address threats to aircraft and passenger safety at BWI Marshall and surrounding areas.

The EA evaluated WS' impacts to red fox and gray fox populations in Maryland with a take of up to 25 animals combined for both species. However, to better understand potential impacts to the red fox and gray fox populations in Maryland, the analyses in this proposed supplement to the EA will separate the analysis by fox species to effectively evaluate potential impacts from the potential increased take of up to 50 red fox. Gray fox continue to pose threats to aircraft and passenger safety at BWI Marshall. Therefore, take of up to 25 gray fox to reduce threats at the airport and adjacent properties remains appropriate as addressed in the EA which will be further analyzed in Section 8.1.2.3.

Woodchucks continue to pose threats to property at the airport as a potential strike hazard and also from the undermining of hard surfaces and structures from burrowing and digging that can cause those structures to collapse. Since FY 2004, the number of woodchucks addressed to reduce threats to property at the airport has increased over 180% (See Table 2). Based on the increasing number of woodchucks addressed at the airport since FY 2004, WS reasonably anticipates requests to reduce hazards associated with woodchucks to continue to increase. As part of an integrated approach to managing threats, the take of up to 150 woodchucks could occur annually to adequately address the increasing threats associated with woodchucks at the airport.

Table 2 – Number of mammal species addressed by WS at BWI Marshall from FY 2003 through FY 2007 that represent an increasing threat to aircraft and passenger safety.

Species	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
Red Fox	0	2	23	39	42
Woodchuck	0	33	58	117	93

As stated previously, the proposed supplement will evaluate potential impacts related to the increased need for the reduction of threats associated American kestrels, mourning doves, killdeer, red fox, and woodchucks at BWI Marshall and surrounding areas. Based on the increasing number of those species addressed at the airport, WS' reasonably anticipates an increase in the number of requests to resolve those threats. WS will continue to employ methods in an integrated approach to effectively reduce threats associated with those species. Methods available to WS as part of an integrated approach are evaluated and discussed in detail in Appendix C of the EA. The increased use of those methods to address an increasing number of requests for assistance to reduce threats will be further evaluated in this proposed supplement to the EA.

4.0 RELATIONSHIP OF THIS EA TO OTHER ENVIRONMENTAL DOCUMENTS

The EA, this report, and the proposed supplement are tiered[9] to the following documents with pertinent information incorporated into this document by reference.

[9]Council on Environmental Quality (CEQ) regulations encourage federal agencies to tier Environmental Assessments to previously prepared Environmental Impact Statements and to incorporate material by reference in order to reduce the volume of National Environmental Policy Act (NEPA) documents (40 CFR 1502.20, 40 CFR 1502.21).

4.1 WS'[10] Programmatic Final Environmental Impact Statement

WS has developed a programmatic Final Environmental Impact Statement (FEIS) that analyzes and addresses potential environmental impacts from various wildlife damage management methods employed by WS (USDA 1997).

4.2 Resident Canada Goose Management Final Environmental Impact Statement

The USFWS has issued a FEIS addressing the need for and potential environmental impacts associated with resident goose damage management activities titled "*Resident Canada Goose Management*" (USFWS 2005). The FEIS also contains detailed analyses of the issues and methods used to manage Canada goose damage. The FEIS may be obtained by contacting the Division of Migratory Bird Management, U.S. Fish and Wildlife Service, 4401 North Fairfax Drive, MBSP-4107, Arlington, Virginia 22203 or by downloading it from the USFWS website at http://www.fws.gov/migratorybirds/issues/cangeese/finaleis.htm. A Record of Decision (ROD) and Final Rule were published by the USFWS on August 10, 2006 (Federal Register Vol. 71, No. 154: 45964- 45993). On June 27, 2007, WS, as a cooperating agency, issued a Record of Decision and adopted the USFWS FEIS (Federal Register Vol. 72, No. 123: 35217).

5.0 SCOPE OF ANALYSIS

The EA, this monitoring report, and the proposed supplement to the EA evaluate wildlife damage management activities at BWI Marshall and surrounding areas (up to 2 miles outside the perimeter of BWI Marshall) to reduce threats to property and threats to passenger safety associated with aircraft striking wildlife. The scope of analysis remains valid as addressed in the EA unless otherwise discussed in the proposed supplement.

5.1 Site Specificity

The EA and this proposed supplement analyzes the potential impacts of wildlife damage management activities that will occur or could occur at BWI Marshall or surrounding areas. WS uses a decision model based on a publication by Slate et al. (1992) which involves evaluating each threat situation, taking action, evaluating, and monitoring results of the actions taken. The published article provides more detail on the processes used in WS' Decision Model. WS' FEIS (USDA 1997) provides more detail and examples of how the model is used. WS' personnel use the Decision Model to develop the most appropriate strategy to reduce damage and to determine potential environmental effects from damage management actions (Slate et al. 1992, USDA 1997, USDA 2003).

6.0 AUTHORITY AND COMPLIANCE

WS' activities to reduce threats associated with aircraft striking wildlife at BWI and surrounding areas are regulated by federal, state, and local laws and regulations. The authority of WS and compliance with relevant laws and regulations are discussed in detail in section 1.8 of the EA (USDA 2003). WS' activities are also conducted consistent with relevant Executive Orders which were discussed in section 1.0 of this report and the proposed supplement. Compliance with laws and regulations not directly addressed in the EA will be discussed in this report and proposed supplement.

[10]On August 1, 1997, the Animal Damage Control program was officially renamed to Wildlife Services. The terms Animal Damage Control, ADC, Wildlife Services, and WS are used synonymously throughout this document.

6.1 Investigational New Animal Drug (INAD)

The Food and Drug Administration (FDA) grants permission to use investigational new animal drugs [21 Code of Federal Regulations (CFR), Part 511]. The sedative drug alpha-chloralose is registered with the Food and Drug Administration to capture waterfowl, coots, and pigeons. The use of alpha-chloralose by WS was authorized by the FDA through approval under the Investigational New Animal Drug which allows use of the drug as a non-lethal form of capture. Alpha-chloralose as a method for resolving bird damage and threats to human safety are discussed in Appendix C of the EA (USDA 2003).

7.0 ISSUES ANALYZED IN DETAIL

The major issues are discussed in detail in Chapter 2 of the EA (USDA 2003). Potential impacts of Alternatives 2, 3, and 4 on the human environment related to the major issues have not changed from those described in the EA and thus do not require additional analyses in this report or the proposed supplement. Chapter 4 of the EA contains a detailed discussion and comparison of the identified alternatives and the major issues (USDA 2003). The issues were identified as important to the scope of the analysis in the EA (40 CFR 1508.25). Alternative 1 (proposed action/no action), as described in the EA, addresses requests for wildlife damage management at BWI Marshall and surrounding areas using an integrated damage management approach by WS to reduce threats to aircraft and human safety from wildlife strikes. The following is an analysis of potential impacts for each of the major issues analyzed in the EA since the completion of the EA and the proposed supplement to the EA as related to Alternative 1:

7.1 Issue 1 - Effects on Target Wildlife Populations

The issue of the effects on target wildlife species arises from the use of non-lethal and lethal methods identified in the EA to address the need for reducing wildlife strikes at BWI Marshall and surrounding areas. Methods employed in an integrated approach to reducing threats to aircraft and human safety at the airport are categorized into non-lethal and lethal methods. Non-lethal methods are employed to exclude, harass, and/or disperse wildlife from areas where threats are occurring to aircraft at the airport or surrounding areas. Lethal methods are often employed to reinforce non-lethal methods and to remove wildlife that poses direct strike threats to aircraft. Both non-lethal and lethal methods have the potential to impact wildlife populations. The EA evaluated those potential impacts and found that when WS' activities are conducted within the scope analyzed in the EA, those activities would not adversely impact wildlife populations in Maryland. WS' mitigation measures and Standard Operating Procedures (SOP) are designed to reduce the effects on wildlife populations and are discussed in section 3.4 of the EA (USDA 2003).

WS provided direct damage management and technical assistance in response to requests for assistance at BWI Marshall and surrounding areas since the completion of the EA. Descriptions and application of direct damage management and technical assistance projects are discussed in detail in section 3.2 of the EA (USDA 2003). All wildlife damage management activities conducted by WS were pursuant to federal, state, and local laws and regulations.

7.1.1 Summary of WS' Wildlife Damage Management Activities

The following is a summary of WS' activities to manage damage and threats caused by wildlife at BWI Marshall and surrounding areas as requested by airport authorities since the completion of the EA in 2003.

7.1.1.1 Wildlife Damage Management Activities at BWI Marshall in FY 2003

WS provided technical assistance and direct operational assistance to BWI Marshall in FY 2003. Technical assistance was provided to airport personnel by providing information and identification of potential threats to aircraft associated with wildlife at the airport and alterations to habitat and structures to discourage wildlife from using airport property. Threats identified and addressed by WS at BWI Marshall and surrounding areas were focused on avian threats in FY 2003. Birds using the airfield were identified as the primary threat to aircraft from potential strikes in FY 2003 with WS' operational assistance focusing on reducing those threats associated with birds found on airport property.

WS' continued to implement and employ an integrated damage management approach to reducing threats to aircraft associated with wildlife. As shown in Table 3, WS employed non-lethal techniques to harass and disperse birds from airport property and surrounding areas. Dispersal occurred through the use of those non-lethal methods describe in Appendix C of the EA, primarily from the use of pyrotechnics and other noise producing methods (USDA 2003). A total of 4,214 birds were dispersed using non-lethal methods in FY 2003. Over 71% of the birds dispersed were European starlings and ring-billed gulls. At least 16 species of birds were addressed at the airport by WS as potential hazards to aircraft in FY 2003.

Table 3 – Number of birds harassed and dispersed at BWI Marshall by WS in FY 2003.

Species	Total	Species	Total
Blackbirds (Mixed)	300	**Herring Gull**	1
American Crow	9	**Ring-billed Gull**	1,233
Mourning Dove	104	**Red-tailed Hawk**	1
Rock Pigeon	3	**Mallards**	286
Cattle Egrets	17	**Osprey**	1
Great Egrets	4	**Red-winged Blackbird**	50
Canada Geese	210	**American Robin**	115
Bonaparte's Gull	120	**European Starling**	1,760
		TOTAL	**4,214**

As part of an integrated approach to resolving threats at the airport, WS also employed lethal methods to reinforce non-lethal techniques and to remove habitual threats on airport property. WS employed those methods described in the EA to take 90 birds in FY 2003 at the airport (see Table 4). Ring-billed gulls, mallards, and Canada geese represented 84% of the birds lethally removed to reduce threats to aircraft with ring-billed gulls comprising over 43% of the take of birds at the airport in FY 2003. Dolbeer et al. (2000) found that gulls were the most frequently struck wildlife species from 1991 through 1998 at airports in the United States. WS' addressed a total of 4,304 birds in FY 2003 that were identified as posing threats to aircraft at BWI Marshall with 98% of those birds harassed or dispersed using non-lethal methods.

Table 4 – Number of birds lethally removed by WS at BWI Marshall in FY 2003.

Species	Total	Species	Total
Rock Pigeon	4	**Laughing Gull**	1
Canada Geese	22	**Ring-billed gull**	39
Bonaparte's Gull	1	**Mallards**	23
		TOTAL	**90**

7.1.1.2 Wildlife Damage Management Activities at BWI Marshall in FY 2004

WS continued to provide technical assistance and direct operational damage management at the request of BWI Marshall in FY 2004. The number of species identified as potential threats at the airport increased in FY 2004 compared to FY 2003. Technical assistance was provided through demonstration of wildlife damage management techniques to airport personnel, assistance with wildlife identification, and with the identification of potential wildlife hazards.

Wildlife species addressed at BWI Marshall and the surrounding area are shown in Table 5 and Table 6. WS addressed at least 18 species of birds at the airport that posed hazards to aircraft from potential strikes. At least 7 species of mammals were also identified has hazards to aircraft or were identified as potential attractants for other wildlife that could be a strike threat. Ring-billed gulls and European starlings were the two species most often addressed in FY 2004. The flocking behavior of those two species poses increased risks due to the potential for aircraft to strike multiple birds during a single event. Aircraft striking multiple birds in flocks not only increases damage to the aircraft but increase the possibility that the damage will lead to catastrophic failure of the aircraft which threatens passenger safety.

Mammals also pose hazards to aircraft not only from the potential for aircraft strikes but mammals can also act as attractants for other mammals and birds that can pose hazards to aircraft. Aircraft striking mammals are much more likely to result in damage when compared to bird strikes (Dolbeer et al. 2000). White-tailed deer and woodchucks were the two species of mammals addressed most often as hazards at the airport in FY 2004. A ranking system of wildlife as strike hazards developed by Dolbeer et al. (2000) ranked deer as the species group with the highest percentage of strikes resulting in damage and the group with the highest percentage of damage classified as “major”. Deer were also ranked as the species group with the greatest potential for strikes to affect the status of a flight. A change in the status of a flight occurs when aircraft aborted take-offs, make precautionary landings, and/or shutdown engines after a strike occurs.

WS’ continued to employ an integrated threat reduction approach to managing wildlife hazards at BWI in FY 2004. The integrated approach employed by WS incorporates multiple methods simultaneously or consecutively to most effectively reduce threats to aircraft from the potential for wildlife strikes. Methods employed to reduce those threats are discussed in detail in the EA (USDA 2003). Methods employed by WS can be classified into non-lethal and lethal methods and were used often in combination to reduce identified threats. Methods used to non-lethally harass and disperse birds and mammals were primarily audio deterrents that simulate the noise produced by lethal methods, such as pyrotechnics and propane cannons. A total of 3,831 birds and 4 deer were harassed or dispersed to alleviate threats to aircraft at the airport in FY 2004. A total of at least 18 species of wildlife were non-lethally harassed or dispersed at the airport. Of the total wildlife addressed in FY 2004, nearly 86% were non-lethally dispersed or harassed to alleviate or prevent hazards to aircraft at BWI Marshall.

Table 5 – Birds dispersed and taken by WS at BWI Marshall in FY 2004.

Species	Dispersed	Take	Species	Dispersed	Take
American Crow	24	0	**Great Blue Heron**	1	2
Mourning Dove	73	34	**Mallards**	288	34
Rock Pigeon	69	147	**Purple Martins**	1	0
Cattle Egrets	36	7	**Red-winged Blackbird**	0	1
Canada Geese	169	32	**Shorebird (Unidentified)**	2	0
Bonaparte's Gull	282	21	**European Starling**	1,374	78
Herring Gull	10	2	**Common Tern**	39	0
Ring-billed Gull	1,453	69	**Wild Turkey**	2	0
Red-tailed Hawk	5	0	**Turkey Vulture**	3	0
			TOTAL	**3,831**	**427**

To reinforce non-lethal methods and to eliminate potential long-term hazards associated with wildlife habitually on or near airport property; certain methods were employed that resulted in the lethal take of those individuals. WS' employed those methods that resulted in take of wildlife as described in the EA in FY 2004 (USDA 2003). Lethal take occurred primarily using a firearm which reinforces the noise produced by non-lethal methods. In FY 2004, WS' activities to reduce threats to aircraft resulted in the lethal take of 427 birds from 11 species. Rock pigeons and European starlings were the two species with the highest take levels. Those two species comprised nearly 53% of the lethal take of birds at the airport. Pigeons and starlings are considered an invasive species in the United States that compete with native species for nesting sites and food resources. Pigeons and starlings are gregarious species that increase hazards to aircraft as described previously. Pigeons and starlings are afforded no protection under the Migratory Bird Treaty Act. All take of native bird species was conducted under a permit issued by the U.S. Fish and Wildlife Service or a depredation order pursuant to the Migratory Bird Treaty Act.

In FY 2004, a total take of 62 mammals also occurred to alleviate and prevent hazards to aircraft at BWI Marshall by WS. Mammals, once entering into airport property, often become confined inside the perimeter fence due to the limited amount of entry points onto airport property and due to the construction and repair of fences to exclude wildlife. Therefore, most mammals are excluded from the airport through a perimeter fence with the fence periodically inspected to identify and repair potential entry points for wildlife. Fencing creates a barrier that makes dispersal and harassment techniques difficult to employ and often ineffective for dispersing mammals.

Table 6 – Mammals dispersed and taken by WS at BWI Marshall during FY 2004.

Species	Dispersed	Take	Species	Dispersed	Take
Beaver	0	3	**Red Fox**	0	2
Muskrat	0	2	**White-tailed Deer**	4	17
Cottontail Rabbit	0	4	**Woodchuck**	0	33
Raccoon	0	1	**TOTAL**	**4**	**62**

Deer and woodchucks were the two mammal species most often addressed at the airport in FY 2004. As stated previously, deer when compared to other wildlife groups are ranked highest in the amount of damage occurring when struck by aircraft and were also ranked the highest amongst wildlife groups having a negative effect on the flight after a strike occurs

(Dolbeer et al. 2000). Woodchucks also pose a strike hazard but also cause damage to runways and taxiways through burrowing which can lead to collapses that require repair. Burrows can also be attractive to other wildlife species for shelter and denning.

7.1.1.3 Wildlife Damage Management Activities at BWI Marshall in FY 2005

WS' activities to alleviate and prevent wildlife strikes at BWI Marshall continued in FY 2005 with the use of an integrated approach to managing wildlife hazards. WS provided technical assistance and direct operational management at the airport in FY 2005. Similar to FY 2004, WS continued to assist airport personnel with wildlife identification, identification of wildlife hazards, and demonstration of the proper use of methods to alleviate threats to aircraft associated with wildlife. Direct operational management was provided to the airport by WS through the use of those methods described in the EA to alleviate or prevent threats to aircraft on or near the airport. Table 7 and Table 8 provide the number of birds and mammals dispersed and taken by WS during FY 2005 at the airport and the surrounding area as part of direct operational management activities.

Table 7 – Birds dispersed and taken by WS at BWI Marshall during FY 2005.

Species	Dispersed	Take	Species	Dispersed	Take
American Crow	18	3	**Great Blue Heron**	1	0
Mourning Dove	144	39	**American Kestrel**	42	0
Rock Pigeon	25	7	**Mallard**	238	24
Cattle Egret	3	2	**Purple Martin**	35	5
Canada Goose	374	33	**Red-winged Blackbird**	0	1
Common Grackle	133	7	**House Sparrow**	0	3
Bonaparte's Gull	120	31	**European Starling**	1,830	108
Ring-billed Gull	1,208	36	**Barn Swallow**	50	10
Red-tailed Hawk	7	0	**Turkey Vulture**	1	0
			TOTAL	**4,229**	**309**

As part of an integrated damage management approach, WS employed both non-lethal and lethal methods to resolve and prevent wildlife strikes at BWI Marshall. A total of 4,229 birds and 1 red-fox were dispersed from the airport using non-lethal methods in FY 2005. Similar to FY 2004, ring-billed gulls and European starlings were the two species of birds most often addressed at the airport. A total of 1,208 ring-billed gulls and 1,830 starlings were dispersed by WS' using non-lethal methods which comprised nearly 72% of the birds harassed at the airport. The number of birds harassed and dispersed at the airport in FY 2005 increased more then 10% when compared to the number of birds addressed in FY 2004. Over 93% of the birds addressed at the airport in FY 2005 were non-lethally harassed and dispersed to alleviate strike hazards.

WS' also employed lethal methods to reinforce non-lethal methods and to alleviate threats associated with wildlife habitually using the airfield. A total of 309 birds and 128 mammals were lethally removed at the airport in FY 2005. The number of birds lethally removed declined by nearly 28% in FY 2005 when compared to the number of birds taken in FY 2004 despite the 10% increase in the number of birds addressed at the airport between FY 2004 and FY 2005. The number of mammals addressed at the airport increased in FY 2005 by over 95% which increased the take of mammals by 106% in FY 2005 compared to the take of mammals in FY 2004. As stated previously, the perimeter fence around the airport limits the movement of mammals confined inside the fence making harassment and dispersal

techniques ineffective in resolving those long-term hazards associated with mammals confined inside perimeter fences. However, mammals inside the perimeter fence originate from those populations outside the fence and are not considered a unique population.

Table 8 – Mammals dispersed and taken by WS at BWI Marshall during FY 2005.

Species	Dispersed	Take	Species	Dispersed	Take
Beaver	0	1	**Red Fox**	1	22
Cottontail Rabbit	0	11	**White-tailed Deer**	0	35
Raccoon	0	1	**Woodchuck**	0	58
			TOTAL	**1**	**128**

European starlings represented the highest number of individual birds removed in FY 2005. A total of 108 starlings were lethally removed using firearms in FY 2005 which represent 5% of the total number of starlings addressed at the airport. Similar to FY 2004, deer and woodchucks were the two most common mammal species taken by WS in FY 2005. The number of red fox identified as hazards increased between FY 2004 and FY 2005. Fox pose strike hazards to aircraft during take-off and landing rolls and can cause damage to landing gear.

7.1.1.4 Wildlife Damage Management Activities at BWI Marshall in FY 2006

WS' provided technical assistance to airport personnel during FY 2006, including recommendations to the Maryland Aviation Administration, Division of Environmental Planning on wetland mitigation issues, habitat management, beaver damage management, pigeon damage management, and airport fencing/deer exclusion. WS also provided recurrent wildlife hazard management training to 15 BWI Marshall Operation's personnel and provided the initial wildlife hazard management training for two employees of the Maryland Aviation Administration, Division of Environmental Planning.

WS' direct operational assistance at BWI Marshall during FY 2006 included management actions directed towards the enhancement of public safety and reduction of property damage through the reduction of wildlife-aircraft strikes. WS' employed an integrated damage management program as described in the EA in FY 2006. As part of the integrated approach to managing threats, WS dispersed 24,917 birds and 52 mammals at the airport. WS' continued to employ the limited use of lethal methods that resulted in the take of 840 birds and 150 mammals at the airport in FY 2006. Table 9 and Table 10 show the number of birds and mammals dispersed and taken by WS at the airport in FY 2006.

European starlings comprised nearly 40% of the birds lethally removed to alleviate and prevent wildlife strikes and nearly 71% of the birds harassed on the airport and adjacent properties. Woodchucks comprised 60% of the mammals lethally removed in FY 2006 and were the mammal most likely harassed on airport property and adjacent areas.

Table 9 – Birds dispersed and taken by WS at BWI in FY 2006.

Species	Dispersed	Take	Species	Dispersed	Take
Red-winged Blackbird	66	38	**Rough-legged Hawk**	5	0
Blackbirds (Mixed)	1,366	0	**Hawk (Unidentified)**	2	0
Brown-headed Cowbird	1,288	41	**Great Blue Heron**	21	11
American Crow	273	15	**Green Heron**	5	1
Mourning Dove	2,266	207	**Little Blue Heron**	1	0
Mallard	82	40	**American Kestrels**	126	7
Hooded Merganser	3	0	**Killdeer**	198	46
Ring-necked Duck	1	0	**Eastern Meadowlark**	100	1
Great Egret	1	0	**Merlin**	1	0
Canada Goose	140	31	**Rock Pigeon**	93	24
Common Grackles	71	6	**American Robins**	147	0
Herring Gull	2	0	**Shorebird (Unidentified)**	14	0
Laughing Gull	0	1	**Common Snipe**	3	0
Ring-billed Gull	842	28	**European Starling**	17,634	327
Cooper's Hawk	5	3	**Wild Turkeys**	4	0
Northern Harrier	1	0	**Turkey Vulture**	5	1
Red-shouldered Hawk	2	2	**Cedar Waxwing**	20	0
Red-tailed Hawk	129	10	**TOTAL**	**24,917**	**840**

The number of birds addressed at the airport in FY 2006 increased by over 467% compared to FY 2005 mainly due to an increase in the number of European starlings crossing and using the airfield. The number of starlings addressed at the airport increased by nearly 827% in FY 2006 compared to FY 2005. The number of birds addressed at the airport for several other species increased also, including the total number of bird species. The number of species of birds addressed increased from 18 in FY 2005 to 32 in FY 2006. The number of mourning doves addressed at the airport in FY 2006, increased by 125% compared to the number addressed in FY 2005. The number of blackbirds also increased in FY 2006 compared to FY 2005.

Table 10 - Mammals dispersed and taken by WS at BWI Marshall in FY 2006.

Species	Dispersed	Take	Species	Dispersed	Take
Beaver	0	1	**Cottontail Rabbit**	1	10
Feral Cat	2	1	**Raccoon**	0	4
White-tailed Deer	7	18	**Gray Fox**	0	1
Woodchucks	27	90	**Red Fox**	15	24
Opossum	0	1	**TOTAL**	**52**	**150**

Similar to previous years, WS continued to employ an integrated approach that addressed threats mainly through the use of non-lethal methods. Over 96% of the wildlife addressed at the airport in FY 2006 were dispersed or harassed using non-lethal methods. Starlings represented the largest number of birds harassed or dispersed at the airport. Over 98% of the starlings addressed at the airport were dispersed using non-lethal methods. Starlings and mourning doves represented the two species with the highest number of take in FY 2006. Over 91% of the mourning doves addressed in FY 2006 were dispersed or harassed.

7.1.1.5 Wildlife Damage Management Activities at BWI Marshall in FY 2007

As described in detail in the EA, WS continued to provide technical assistance and direct operational damage management to BWI Marshall as requested. WS' provides technical assistance by providing recommendations to the Maryland Aviation Administration, Division of Environmental Planning on wetland mitigation issues, blackbird habitat management, beaver damage management, pigeon damage management, and airport fencing/deer exclusion in FY 2007. WS provided FAA required recurrent wildlife hazard management training to 23 Maryland Aviation Administration personnel from BWI Marshall Operations, Environmental Planning, and Maintenance Divisions.

The number of wildlife and the number of species of wildlife addressed at BWI in FY 2007 continued to increase from those addressed in FY 2006. Table 11 and Table 12 show the number of birds and mammals addressed at the airport by fate in FY 2007. WS addressed at least 38 species of birds at the airport in FY 2007 an increase from at least 32 bird species in FY 2006. The number of wildlife addressed in FY 2007 increased to 45,889 an increase of 77% over the number of wildlife addressed in FY 2006.

Table 11 - Birds dispersed and taken by WS at BWI Marshall in FY 2007.

Species	Dispersed	Take	Species	Dispersed	Take
Red-Winged Blackbird	90	56	**Red-shouldered Hawk**	4	2
Blackbirds (Mixed)	7,280	8	**Red-tailed Hawk**	149	17
Brown-Headed Cowbird	1,100	336	**Rough-legged Hawk**	2	0
American Crow	221	25	**Sharp-shined Hawk**	0	1
Mourning Dove	699	318	**Great Blue Heron**	18	6
American Black Duck	1	1	**Green Heron**	7	2
Mallard	105	34	**Killdeer**	215	41
Wood Duck	2	0	**Eastern Meadowlark**	30	0
Great Egret	5	3	**Osprey**	1	1
Snowy Egret	0	1	**Barred Owl**	0	1
American Kestrels	162	43	**Great Horned Owl**	1	1
Merlin	1	0	**Rock Pigeon**	34	19
Canada Goose	1,000	86	**American Robin**	5	4
Common Grackle	329	18	**Common Snipe**	2	0
Bonaparte's Gull	3	2	**European Starling**	32,345	380
Herring Gull	15	5	**Barn Swallow**	13	19
Laughing Gull	6	0	**Caspian Tern**	1	2
Ring-billed Gull	290	60	**Wild Turkeys**	4	1
Cooper's Hawk	3	3	**Turkey Vultures**	27	7
Northern Harrier	7	1	**TOTAL**	**44,177**	**1,504**

WS continued to employ non-lethal and lethal methods to resolving threats to aircraft associated with wildlife at BWI Marshall. Of the wildlife addressed at the airport, over 96% were addressed using non-lethal dispersal techniques. Nearly 97% of the birds addressed in FY 2007 were dispersed or harassed from the airfield using non-lethal methods. Like previous years, the European starling comprised the largest number of birds addressed at the airport. Of the birds addressed at the airport in FY 2007, nearly 72% of those birds were starlings.

Table 12 - Mammals dispersed and taken by WS at BWI Marshall in FY 2007.

Species	Dispersed	Take	Species	Dispersed	Take
Feral Cat	0	2	**Woodchucks**	4	89
White-tailed deer	29	15	**Cottontail Rabbits**	0	24
Red Fox	17	25	**Raccoons**	0	3
			TOTAL	**50**	**158**

Woodchucks, deer, and red fox continued to be a major concern at the airport in FY 2007. Similar to previous years, threats to aircraft from potential strikes with mammals species were addressed primarily using lethal methods. WS removed 158 mammals deemed threats to aircraft in FY 2007, primarily woodchucks. WS also employed non-lethal harassment and dispersal techniques to disperse 50 mammals at the airport in FY 2007. Overall, the number of mammals addressed at the airport in FY 2007 was similar to the number addressed in FY 2006.

7.1.1.6 Population Impact Analysis from WS' activities at BWI

The EA concluded that the effects of WS' damage management activities at BWI Marshall and the surrounding area would not negatively impact those populations of bird and mammal species addressed in the EA when damage management activities occurred within the scope analyzed. WS' lethal take of wildlife species to alleviate damage and threats to human safety were within the estimated level of lethal take analyzed in the EA from FY 2003 through FY 2007, except for take of mourning doves that occurred in FY 2006 and FY 2007, the lethal take of Bonaparte's gulls in FY 2004 and FY 2005, and the lethal take of killdeer in FY 2006 and FY 2007. Take occurred above the levels analyzed in the EA but were within limits of the depredation permits issued to WS' or to BWI Marshall by the USFWS pursuant to the Migratory Bird Treaty Act.

Analyses conducted during the annual monitoring of WS' activities at BWI Marshall determined that WS' increased take of mourning doves, Bonaparte's gulls, and killdeer were not negatively impacting populations based on the best available information on those species' populations. The USFWS permitting those activities pursuant to the Migratory Bird Treaty Act provides additional analyses and outside review that WS' activities at BWI Marshall since FY 2003 have not negatively impacted populations of those birds addressed at the airport.

WS' damage management activities were site specific, and although local populations of target wildlife species may have been reduced, there was no probable adverse impact on statewide, regional, or national populations of those species from WS' activities from FY 2003 through FY 2007. The potential impacts of program activities on wildlife species have not changed from those analyzed in the EA. All take occurred under a depredation permit issued by the USFWS pursuant to the Migratory Bird Treaty Act. Therefore, based on the annual monitoring of WS' activities at BWI Marshall and surrounding areas being within the scope analyzed in the EA, except for the species stated, WS' activities have not had an adverse impact on wildlife populations.

7.1.2 Population Impact Analysis of the Proposed Supplement to the EA

To further analyze WS' activities at BWI Marshall and to clearly communicate to the public the potential individual and cumulative impacts of those activities, WS has prepared this summary

report and supplement to the EA. The supplement will further address WS' increased take of wildlife at the airport to reduce threats to aircraft from wildlife strikes. As described in section 3.1 of this report and supplement, threats at BWI Marshall involving American kestrels, killdeer, mourning doves, red fox, and woodchucks have increased since the completion of the EA. WS' continues to assist the airport in identifying habitat and structures that act as an attractant to wildlife on airport property. However, threats posed by kestrels, killdeer, doves, fox, and woodchucks to aircraft at the airport are likely to continue to increase as those populations continue to expand. WS' potential impacts to those wildlife species from an increase in take associated with reducing threats to aircraft at the airport are analyzed in this supplement to the EA.

7.1.2.1 American Kestrel Population Impact Analysis

The need for reducing threats associated with kestrels is addressed in the EA and in section 3.1 of this report and supplement. The number of kestrels identified as hazards at the airport has increased since the completion of the EA in FY 2003. As shown in Table 1, the number of kestrels addressed increased from zero in FY 2003 to 205 in FY 2007. Kestrels deemed habitual threats to aircraft at the airport are removed to reduce threats associated with strikes occurring between aircraft and kestrels.

Impacts of take on kestrel populations were not directly analyzed in the EA since kestrels were not identified as a significant hazard at the airport during the scoping and development of the EA in FY 2003 based on prior activities to reduce threats of wildlife strikes at the airport. However, lethal take of species outside those directly analyzed in the EA were considered in the EA. The analyses in the EA determined that take of no more than 30 individuals from any of those species not directly analyzed would not adversely impact those populations. Since the completion of the EA, the number of kestrels using the airport and surrounding areas has increased and has been deemed a consistent and significant threat to aircraft at the airport when found on airport property or surrounding areas where strikes could occur.

In FY 2007, 43 kestrels were identified as potential threats to aircraft and were lethally removed from airport property. The take level of kestrels in FY 2007 exceeded the level analyzed in the EA. However, WS' take was within the kestrel take level authorized by permit from the USFWS pursuant to the Migratory Bird Treaty Act. The number of kestrels addressed as threats at the airport has increased since FY 2003 and will likely continue to increase. Based on the increase in the number of kestrels addressed at the airport recently, WS anticipates the take of kestrels to increase to no more than 50 kestrels annually.

According to trend data available from the Breeding Bird Survey (BBS), American kestrels are showing a decline in Maryland estimated at -2.3% annually since the BBS was initiated in 1966 (Sauer et al. 2007). Kestrels observed on routes in the eastern U.S. have also shown a slight decline estimated at -0.3% annually with a similar -0.2% decline estimated for kestrels across BBS routes in the United States (Sauer et al. 2007). Trend data available from the Christmas Bird Count (CBC) also indicates a decline in kestrel populations wintering in Maryland (National Audubon Society 2002). The Partners in Flight population database currently estimates the population of kestrels in Maryland at 3,500 individuals with the population across the United States estimated at nearly 2.9 million individuals (Partners in Flight 2007). WS' take of 50 kestrels at BWI Marshall would reduce the estimated population by approximately 1.4%.

WS' will continue to assist airport personnel in identifying habitat, food sources, and structures that can act as attractants to raptors on airport property, including kestrels. WS' will also continue to address threats associated with kestrels using non-lethal harassment methods at the airport and surrounding areas. Kestrels at the airport and surrounding areas will be addressed using live-trapping and relocation methods when possible. However, kestrels at the airport and surrounding areas may be lethally removed when deemed an imminent threat to aircraft and passenger safety. Since FY 2005, nearly 87% of the kestrels addressed as threats were dispersed or harassed using non-lethal methods. All take of kestrels occurred within the levels permitted by the USFWS pursuant to the Migratory Bird Treaty Act. WS' limited take of kestrels at the airport and the permitting of those take levels by the USFWS pursuant to the Migratory Bird Treaty Act ensures those activities will not adversely impact kestrel populations.

7.1.2.2 Killdeer Population Impact Analysis

Similar to kestrels, impacts to killdeer populations were not specifically analyzed in the EA but the lethal take of species outside those directly analyzed in the EA were considered. The impacts analysis conducted for those species not directly addressed in the EA determined that a lethal take of no more than 30 individuals annually would have minimal impacts on the populations of any species given the small magnitude of the number of individuals likely taken. However, the lethal take of 46 killdeer in FY 2006 and 41 killdeer in FY 2007 exceeded the level analyzed in the EA of 30 individuals. Monitoring of activities at the airport in FY 2006 determined the take of 46 killdeer would have no impact on killdeer populations in Maryland. Take of killdeer in FY 2006 and FY 2007 were within take levels permitted by the USFWS pursuant to the Migratory Bird Treaty Act.

Due to the increasing number of killdeer determine to be threats to aircraft requiring lethal removal, the number of killdeer lethally removed by WS is also likely to continue to increase. The number of killdeer addressed at the airport has increased the last two years. No killdeer were addressed at the airport from FY 2003 through FY 2005. However, a total of 500 killdeer combined were addressed as threats to aircraft in FY 2006 and FY 2007. Based on the increasing number of killdeer using the airport property and the increasing threat those birds pose to aircraft, WS' take of killdeer could increase to no more that 75 birds annually at the airport to reduce threats to aircraft.

Since 1966, killdeer are showing an increasing trend in Maryland estimated at 0.7% according to BBS trend data (Sauer et al. 2007). Killdeer observed on BBS routes in the eastern United States are showing a slightly increasing trend estimated at 0.2% annually since 1966 and a stable trend across the United States (Sauer et al. 2007). With a relative abundance estimated at 3.25 in Maryland (Sauer et al. 2007), the killdeer population could be estimated at approximately 4,000 birds. Using a killdeer population estimated at 4,000 birds in Maryland, WS' lethal removal of 75 killdeer would constitute 1.9% of the estimated population in Maryland. WS' impacts are likely much lower given the number of killdeer in Maryland is likely more than 4,000 birds given the bias associated with BBS data that are described in the EA. Survey data from the CBC indicates killdeer have been cyclical in Maryland since 1966 (National Audubon Society 2002). Current data shows a declining wintering trend after a period of higher killdeer counts. No population data is currently available for killdeer from the Partners in Flight bird population database (Partners in Flight 2007).

As with kestrels, WS' will continue to assist airport personnel in identifying habitat and other attractants to killdeer on airport property. Killdeer will also be addressed using primarily non-lethal harassment and dispersal methods. Nearly 83% of the killdeer addressed as threats in FY 2006 and FY 2007 were dispersed or harassed using non-lethal methods. All take of killdeer occurred within the levels permitted by the USFWS pursuant to the Migratory Bird Treaty Act. WS' limited take of killdeer at the airport and the permitting of those take levels by the U.S. Fish and Wildlife Service pursuant to the Migratory Bird Treaty Act ensures those activities will not adversely impact killdeer populations.

7.1.2.2 Mourning Dove Population Impact Analysis

The number of mourning doves addressed at the airport increased from 104 in FY 2003 to 1,017 birds in FY 2007 an increase of nearly 878%. The number of doves deemed threats to aircraft requiring lethal removal has also increased since completion of the EA. Potential impacts to dove populations from WS' activities at BWI Marshall and surrounding areas were specifically analyzed in the EA. Based on information available during the scoping and development of the EA, the potential impacts of take of up to 100 doves were analyzed. Analysis in the EA determined the take of 100 doves as part of an integrated approach to reduce strike hazards at the airport would not adversely impact dove populations. However, in FY 2006 and FY 2007 an increasing number of doves were identified as potential strike hazards to aircraft leading to an increase in the lethal take of doves that exceeded 100 but were within the number permitted by the USFWS pursuant to the Migratory Bird Treaty Act.

In FY 2006, 207 doves were lethally removed by WS at the airport and increased to 328 doves removed in FY 2007. Information gathered during the annual monitoring of WS' activities at BWI Marshall determined that the increased take of doves in FY 2006 did not adversely impact dove populations. Based on the increasing number of doves addressed at the airport, WS' take of doves to adequately addressed threats could increase to 500 doves annually.

Trend data available from the BBS indicates mourning dove populations in Maryland are showing an increasing trend estimated at 0.1% annually since 1966. In the United States, dove populations are trending downward estimated at -0.1% annually but significantly increasing in the eastern survey routes estimated at 0.5% annually since 1966 (Sauer et al. 2007). Wintering trend data for doves in Maryland shows a slightly increasing trend since 1966 (National Audubon Society 2002). The Partners in Flight database estimates the dove population in Maryland to be 360,000 individuals with a United States population estimated at nearly 109 million (Partners in Flight 2007). If WS' activities to reduce threats to aircraft involved the take of 500 doves, those activities would impact 0.13% of the estimated Maryland dove population.

A regulated harvest season exists for mourning doves in Maryland with take of 12 doves per day allowed and with a possession limit of 24 doves. Estimated take of doves during the 2005-2006 regulated harvest season was estimated to be 241,700 ± 35% in Maryland (Dolton et al. 2007). The preliminary take estimate for the 2006-2007 harvest season in Maryland was 162,700 ± 28% doves (Dolton et al. 2007). The preliminary take of doves during the 2006-2007 regulated harvest season in the United States has been estimated at 19.2 million ± 5% (Dolton et al. 2007). WS' take of 500 doves to reduce threats to aircraft at BWI Marshall and surrounding areas would represent 0.3% of the estimated 2006-2007 harvest of doves during the regulated harvest season in Maryland. WS' limited take of doves in Maryland

would not limit the ability to harvest doves by those interested during the regulated harvest season.

Based on current population information for mourning doves, WS' lethal take of up to 500 doves to reduce threats to aircraft at BWI and surrounding areas would not adversely impact dove populations in Maryland considering the number of doves harvested in the State and in the United States during the regulated season. All take would occur under permit from the USFWS pursuant to the Migratory Bird Treaty Act which also ensures WS' activities will not negatively impact dove populations. Since FY 2003, nearly 85% of the doves addressed at the airport were non-lethal harassed and dispersed from the airfield. WS will continue to address doves using primarily non-lethal methods. WS' will also continue to assist the airport in habitat modification to reduce the attractiveness of airport property to doves.

7.1.2.3 Red Fox Population Impact Analysis

The number of red fox addressed at BWI Marshall by WS has increased every year since the completion of the EA. In FY 2003, no fox were identified as threats to aircraft at the airport but increased to 42 red fox addressed in FY 2007. Based on the increasing number of red fox addressed at the airport since FY 2003, WS' anticipates the number of fox addressed to continue to increase. The EA addressed red fox and gray fox populations and potential impacts of lethal removal on a combined total of 25 fox annually to reduce threats to aircraft. The analysis in the EA determined that take of 25 fox annually would not adversely impact fox populations in Maryland. The analysis in the EA for the take of up to 25 gray fox remains appropriate as analyzed. The take of 25 gray fox will not adversely impact gray fox populations in Maryland. However, based on the increasing number of red fox addressed at the airport to reduce threats to aircraft, WS' reasonably anticipates that take of red fox may increase to 50 red fox taken annually to adequately address threats to aircraft at the airport.

The current population of red fox in Maryland is unknown. As noted in the EA, the Maryland Department of Natural Resources (MDNR) during the scoping and development of the EA estimated the red fox population in Maryland to be stable to increasing across the state. Based on the best available information during the development of the EA, the red fox population was estimated at between 992 to 3,968 individuals (USDA 2003). This estimate is likely low considering that during the 2005-2006 harvest season for red fox in Maryland, licensed fur dealers purchased 1,440 red fox pelts in Maryland indicating a harvest of at least 1,440 red fox if all fox caught that year were sold to licensed dealers in Maryland (MDNR 2007).

Based on the estimated fox population of 992 to 3,968 individuals, WS' take of 50 red fox to reduce threats to aircraft at the airport would reduce the estimated fox population by 1.3% to 5%. However, as stated previously, the red fox population in Maryland is likely much higher given the number of pelts sold to licensed fur dealers during the 2005-2006 harvest season. Based on this information, the take of 50 red fox by WS to reduce threats to aircraft at BWI Marshall will not adversely impact red fox populations in Maryland and will not limit the ability of those interested in harvesting red fox. There continues to be neither a daily take limit nor possession limit on red fox in Maryland during the regulated harvest season. Consulting with the MDNR will ensure WS' take of red fox is within management goals set for red fox in Maryland.

7.1.2.4 Woodchuck Population Impact Analysis

Similar to red fox, the number of woodchucks address at the airport has also increased since the completion of the EA. No woodchucks were identified as hazards at the airport in FY 2003 but increased to 93 woodchucks addressed in FY 2007 with a peak of 117 woodchucks addressed in FY 2006. Based on the increasing number of woodchucks addressed at the airport and the difficulties of dispersing woodchucks using non-lethal methods, WS' reasonable anticipates the need for take of woodchucks to increase to 150 individuals annually to adequately reduce threats to aircraft at the airport.

There are currently no population estimates for woodchucks in Maryland. The MDNR continues to classify woodchucks as an unprotected mammal in Maryland with no restrictions on take. There are no closed seasons and no take limits on woodchucks in Maryland. No harvest data is currently available for woodchucks in Maryland. The MDNR allows the unlimited take of woodchucks; therefore, WS' take of 150 woodchucks will not adversely impact populations in Maryland. WS' will continue to coordinate take levels with the MDNR to ensure take of woodchucks does not adversely impact populations in Maryland and are within management goals.

7.2 Issue 2 - Effects on Other Wildlife Species, Including Threatened and Endangered Species

No non-target species of wildlife have been taken by WS during direct wildlife damage management assistance at the airport nor has take of any federal or state threatened and endangered (T&E) species occurred. No negative effects on non-target wildlife species populations or their habitats have been identified. A review of T&E species listed by the USFWS showed that no additional listings of T&E species in Anne Arundel County, Maryland have occurred since the completion of the EA. Thus, WS' determination that the program activities would not adversely affect any T&E species is still valid for the proposed action.

Program activities and their potential impacts on non-target wildlife species, including T&E species have not changed from those analyzed in the EA. Activities as discussed in the supplement to the EA will not be additive to any effects on non-target wildlife species including T&E species. Impacts on non-target wildlife species, including T&E species populations, from WS' current activities at the airport and those proposed under the supplement to the EA are expected to remain insignificant.

7.3 Issue 3 - Economic Losses to Property as a Result of Wildlife Damage

A major concern of the airport industry is the economic impact of wildlife damage to aircraft and other property. The EA concluded that an integrated approach to wildlife damage management had the greatest potential of successfully reducing mammal and bird damage to property at BWI Marshall. Conflicts with birds and mammals were reduced at BWI Marshall where WS provided direct management assistance thereby alleviating the threat of economic losses to property.

The potential impacts on reducing wildlife damage to property have not changed from those analyzed in the EA. The proposed activities under the supplement to the EA will allow WS' to further reduce potential threats associated with wildlife striking aircraft and the damage caused by those strikes. Therefore, the economic losses to property could potentially be reduced further. Impacts of the program on this issue are expected to remain insignificant.

7.4 Issue 4 - Effects on Human Health and Safety

Management activities conducted by WS at BWI Marshall have not resulted in any injuries or illness to any members of the public or to WS' personnel. WS' program activities had a positive impact in those situations that reduced the risks of potential injury, illness and loss of human life from injurious bird and mammal species associated with aircraft strikes. The EA concluded that an integrated approach to wildlife damage management had the greatest potential of successfully reducing potential risks to human health and safety at BWI Marshall.

Program activities and methods, and their potential impacts on human health and safety have not changed from those analyzed in the EA. Activities addressed in the supplement to the EA will not increase risks associated with those activities nor employ additional methods that would increase the risks to human safety. Impacts of the program on this issue are expected to remain insignificant.

7.5 Issue 5 - Effects on Aesthetics

All methods employed as part of an integrated approach to reducing threats to aircraft from wildlife strikes are restricted to BWI Marshall property and adjacent sites. The number of birds and mammals dispersed and lethally removed from the airport and adjacent sites had minimal impacts to wildlife species in the area. Therefore, WS' activities did not limit the opportunity to view or enjoy wildlife in the area. Wildlife resources in the area remained common and abundant, and available for viewing by persons with that interest.

Program activities and methods and their potential impacts on aesthetics have not changed from those analyzed in the EA. The effects on aesthetics from an increase in activities as described in the supplement to the EA will not further increase any effects on aesthetics. Those species addressed in the EA are common and abundant in Maryland and can be reasonably viewed outside of the airport if efforts are made. Impacts of the program on aesthetics are expected to remain insignificant.

7.6 Issue 6 - Humaneness and Animal Welfare Concerns of Lethal Methods Used by WS

Program activities and the issue of the humaneness of methods have not changed from those analyzed in the EA. The EA concluded that methods used by WS to manage wildlife damage are relatively humane, but that some persons will view some methods used as inhumane.

Program activities and methods and their potential impacts on this issue have not changed from those analyzed in the EA. Methods employed under the supplement to the EA will not further impact the issue of humaneness nor are new methods being proposed that would change the effects of humanness from those addressed in the EA. Impacts of the program on humaneness and animal welfare are expected to remain insignificant.

8.0 ISSUES ADDRESSED BUT NOT IN DETAIL

In addition to the identified major issues considered in detail, one other issue was considered in section 2.3 of the EA but was not analyzed in detail. WS has reviewed the issue not considered in detail as described in the EA and has determined that the analyses provided in the EA is still appropriate regarding that issue.

9.0 DESCRIPTION OF THE ALTERNATIVES

The alternatives considered and evaluated using the identified issues are described and discussed in detail in Chapter 3 of the EA (USDA 2003). The EA describes four potential alternatives that were developed to address the issues identified above. Alternatives analyzed in detail include:

Alternative 1 - WS integrated wildlife damage management program (Proposed Action/No Action)
Alternative 2 - WS non-lethal wildlife damage management program only
Alternative 3 - WS lethal wildlife damage management program only
Alternative 4 - No WS wildlife damage management program

10.0 ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL

Three additional alternatives were considered but not analyzed in detail in the EA. WS has reviewed the alternatives not analyzed in detail in the EA and has determined that the analyses provided in the EA have not changed and are still appropriate.

11.0 WILDLIFE DAMAGE MANAGEMENT METHODS

A description of the wildlife damage management methods that could be used or recommended by WS is provided in Appendix C of the EA (USDA 2003), in Appendix J of WS' programmatic FEIS (USDA 1997), and Chapter 2 (pages 1-9) of the USFWS Canada Goose FEIS (USFWS 2005). Since the completion of the EA, the following additional methods could be used or recommended as part of an integrated damage management strategy to alleviate bird damage:

11.1 Nicarbazin (NCZ)

OvoControl–G™ is an EPA registered reproductive inhibitor containing NCZ that can be used to reduce Canada goose egg production and viability. NCZ is registered for use at site specific locations in highly populated urban areas. The user of this chemical product must adhere to all EPA use restrictions. VerCauteren et al. (2000) examined the use of NCZ to reduce Canada goose egg production and viability, and found that NCZ did experimentally reduce egg viability, but that there were difficulties in delivery methods and acceptance of treated feed. NCZ is not currently registered for use in Maryland. If NCZ becomes available for use in Maryland, WS will evaluate the use as part of an integrated damage management strategy and will supplement the EA pursuant to NEPA as appropriate.

12.0 MITIGATION AND STANDARD OPERATING PROCEDURES

Mitigation measures are any features of an action that serve to prevent, reduce, or compensate for effects that otherwise might result from that action. As appropriate, mitigation measures are incorporated in WS' SOPs. The current WS' program, nationwide and in Maryland, uses many SOPs. SOPs are discussed in Chapter 3 (section 3.4) of the EA (USDA 2003) and Chapter 5 of WS' programmatic FEIS (USDA 1997). The SOPs discussed in the EA remain appropriate for WS' wildlife damage management activities conducted at BWI Marshall and surrounding areas.

13.0 CUMULATIVE IMPACTS

Cumulative impacts, as defined by CEQ (40 CFR 1508.7), are impacts to the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future

actions, regardless of what agency (federal or non-federal) or person undertakes such actions. Cumulative impacts may result from individually minor, but collectively significant, actions taking place over time.

WS' wildlife damage management activities would be the primary federal program with damage management responsibilities; however, other entities may conduct similar activities in Maryland as permitted by the USFWS and the MDNR. Through ongoing coordination with the USFWS and MDNR, WS is aware of such activities and may provide technical assistance in such efforts. WS does not normally conduct direct damage management activities concurrently with other entities in the same area, but may conduct activities at adjacent sites within the same timeframe. The potential cumulative impacts analyzed below could occur either as a result of WS' program activities over time or as a result of the aggregate effects of those activities combined with the activities of other agencies and individuals.

13.1 Cumulative Impacts on Wildlife Populations

Evaluation of WS' activities relative to wildlife populations indicated that program activities will likely have no cumulative adverse effects on populations in Maryland. WS' actions would be occurring simultaneously, over time, with other natural processes and human generated changes that are currently taking place. Those activities include, but are not limited to:

- Natural mortality of wildlife
- Human-induced mortality through private damage management activities
- Human and naturally induced alterations of wildlife habitat
- Annual and perennial cycles in population densities

All those factors play a role in the dynamics of wildlife populations. In many circumstances, requests for assistance arise when some or all of those elements have contrived to elevate target species populations or place target species at a juncture to cause damage to resources. WS' actions taken to minimize or eliminate damage are constrained as to scope, duration and intensity, for the purpose of minimizing or avoiding impacts to the environment. WS evaluates damage occurring, including other affected elements and the dynamics of the damaging species; determines appropriate strategies to minimize effects on environmental elements; applies damage management actions; and subsequently monitors and adjusts/ceases damage management actions (Slate et al. 1992). This process allows WS to take into consideration other influences in the environment, such as those listed above, in order to avoid cumulative adverse impacts on target species.

No cumulative adverse impacts on wildlife populations are expected from WS' actions based on the following considerations:

13.1.1 Historical outcomes of WS' programs on wildlife

No cumulative adverse affects have been identified for wildlife as a result of program activities implemented over time based on analyses contained in the EA, from annual monitoring reports, or from analyses contained in the proposed supplement. WS' continues to implement an integrated damage management program that adapts to the damage situation and the species involved with causing the damage. WS' only targets wildlife causing damage and only after a request for assistance is received. All program activities are coordinated with appropriate federal, state, and local entities to ensure WS' activities do not adversely impact the populations of any native wildlife species.

Since the completion of the EA, the number of species and the total number of wildlife addressed at BWI Marshall has increased annually which provides some indication that WS' activities at the

airport are not cumulatively impacting populations. WS' continues to implement an integrated program at the airport that employs primarily non-lethal dispersal and harassment methods. WS will continue to provide technical assistance to the airport to identify and alleviate conditions that could increase the attractiveness of the airfield to wildlife.

13.1.2 SOPs and mitigation strategies built into WS' program

SOPs and mitigation measures are designed to reduce the potential negative effects of WS' actions on wildlife, and are tailored to respond to changes in wildlife populations which could result from unforeseen environmental changes. This would include those changes occurring from sources other than WS. Alterations in program activities are defined through SOPs and mitigation measures, and implementation is insured through monitoring, in accordance with the WS' Decision Model (Slate et al. 1992).

13.1.3 Current status of potentially affected wildlife species

Natural and human-induced mortality patterns for wildlife are expected to remain essentially unchanged in Maryland despite WS' activities. As a result, no cumulative adverse affects are expected from repetitive damage management programs over time in the fairly static set of conditions currently affecting wildlife in Maryland.

13.1.4 Migratory Bird Treaty Act, as amended

The Migratory Bird Treaty Act, as amended, places the protection of all bird species designated under the Act under the management authority of the USFWS. All take under damage management purposes is authorized by permit pursuant to the Act issued by the USFWS. Oversight of the allowed take of bird species by the USFWS ensures cumulative impacts are considered and addressed when determining the allowable take of bird species to ensure the viability of a population. The allowed take, including cumulative take, is analyzed and determine by the USFWS prior to the issuance of permits under the Act. Therefore, WS' allowed take, as authorized by the USFWS by permit, should not reach a level where cumulative take would adversely impact bird populations.

13.2 Cumulative Impact Potential from Chemical Components

Wildlife damage management which includes the use of pesticides as a lethal population management component may have the greatest potential for cumulative impacts on the environment. Potential impacts relate to the deposit of chemical residues in the physical environment causing environmental toxicosis.

DRC-1339 and Avitrol are the only chemicals potentially used by WS at the airport for the purpose of obtaining lethal effects on birds. Those chemicals have been evaluated for possible residual effects which might occur from buildup of the chemicals in soil, water, or other environmental sites.

DRC-1339 exhibits a low persistence in soil or water, and bioaccumulation of the chemical is unlikely (USDA 1997). Additionally, the relatively small quantity of DRC-1339 that will be used to manage threats from birds at BWI Marshall, the chemical's instability which results in degradation of the product, and application protocol used in WS' activities further reduces the likelihood of any environmental accumulation. DRC-1339 is restricted to use by USDA personnel only and is not used by any other entities in Maryland.

Avitrol may be used or recommended by the Maryland WS' program at BWI Marshall and surrounding areas. Most applications would not be in contact with soil and applications would not be in contact with surface or ground water. Uneaten baits will be recovered and disposed of according to EPA label specifications. Avitrol exhibits a high persistence in soil and water but, according to literature, does not bioaccumulate (USDA 1997, EXTOXNET 2000). Because of Avitrol's characteristic of binding to soils, it is not expected to be present in surface or ground water as a result of its use on land (EPA 1980). A combination of chemical characteristics and baiting procedures used by WS would reduce the likelihood of environmental accumulation of Avitrol. The EPA has not required studies on the fate of Avitrol in the soil because, based on use patterns, soil residues are expected to be low (EPA 1980).

Based on use patterns, the chemical and physical characteristics of DRC-1339 and Avitrol, and factors related to the environmental fate of those pesticides, no cumulative impacts are expected from the lethal chemical components used or recommended by the WS' to manage threats to aircraft at BWI Marshall.

Non-lethal chemicals may also be used or recommended by the WS' program in Maryland. Characteristics of those chemicals and use patterns indicate that no significant cumulative impacts related to environmental fate are expected from their use in reducing hazards to aircraft at BWI Marshall and surrounding areas.

13.3 Cumulative Impact Potential from Non-chemical Components

Non-chemical methods used or recommended by WS' program may include exclusion through use of various barriers, habitat modification of structures or vegetation, live trapping and euthanasia of wildlife, harassment of wildlife, and shooting.

Because shooting may be considered as a component of the non-chemical, the deposition of lead shot in the environment is a factor considered in the EA and this supplement.

Lead Shot. Threats of lead toxicosis to waterfowl from the deposition of lead shot in waters where such species feed were observed more than one hundred years ago (Sanderson and Bellrose 1986). As a result of discoveries made regarding impacts to several species of ducks and geese, federal restrictions were placed on the use of lead shot for waterfowl hunting in 1991. "Beginning September 1, 1991, the contiguous 48 United States, and the States of Alaska and Hawaii, the Territories of Puerto Rico and the Virgin Islands, and the territorial waters of the United States, are designated for the purpose of Sec. 20.21 (j) as nontoxic shot zones for hunting waterfowl, coots, and certain other species. "Certain other species" refers to those species, other than waterfowl or coots, affected by reason of being included in aggregate bags and concurrent seasons."

All WS' shooting activities conform to federal, state and local laws. If activities are conducted near or over water, WS uses non-toxic shot during activities. Consequently, no deposition of lead in non-toxic shot zones is likely to occur as a result of WS' actions at the airport. Therefore, cumulative impacts are not likely to occur if toxic shot is used. Additionally, WS will evaluate other actions which entail the use of shot on a case by case basis to determine if deposition of lead shot poses any risk to non-target animals. If such risk exists, WS will use non-toxic shot in those situations.

Roost Harassment/Relocation. Some potential exists for cumulative impacts to human health and safety related to the harassment of roosting bird flocks such as blackbirds and European starlings in urban environments. If birds are dispersed from one site and relocate to another where human exposure to concentrations of bird droppings over time occurs, human health and safety could be

threatened. If WS is providing direct operational assistance in relocating such birds, coordination with local authorities may be conducted to assure they do not re-establish in other undesirable locations.

13.4 SUMMARY OF CUMULATIVE IMPACTS

No significant cumulative environmental impacts are expected from activities considered under the supplement to the EA. Likewise, no significant cumulative impacts have been identified from the implementation of the proposed action in the EA since 2003. Under the proposed action, the reduction of wildlife threats to aircraft using an integrated approach employing both non-lethal and lethal methods would not have significant impacts on wildlife populations in Maryland or nationwide. WS' continues to coordinate activities with federal, state, and local entities to ensure activities do not adversely impact wildlife populations. No risk to public safety is expected when WS' activities are conducted pursuant to the proposed action or the proposed supplement to the EA. The EA further describes and addresses cumulative impacts from the alternatives, including the proposed action.

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